AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A bandwidth allocation device for an Ethernet Passive Optical Network (EPON) including an optical line termination (OLT), an optical distribution network (ODN), and a plurality of optical network units (ONU),

wherein the optical line termination includes a Multi-Point Control Protocol (MPCP) allocator, and each ~~the~~ optical network unit includes an MPCP requester,

said MPCP allocator including:

a class-based queue state counter which differentiates the optical network units~~,~~ upon receipt of a control message for upstream report (REPORT) from a Medium Access Control (MAC) control layer, and obtains class-based queue length information of the optical network units; and

a grant generator which, when queue state information of all the optical network units is obtained through the class-based queue state counter, generates a service-based bandwidth for each of the optical network units, and transmits a downstream control message for upstream bandwidth allocation (GATE),

said MPCP requester including:

a class-based buffer counter which counts a class-based buffer length~~,~~ upon receipt of the downstream control message for upstream bandwidth allocation from the grant generator; and

a request generator which generates class-based buffer length information, and transmits ~~the~~ an upstream control message for upstream report containing the generated buffer length information.

2. (Original) The bandwidth allocation device as set forth in claim 1, wherein the downstream control message as a grant of an upstream bandwidth request includes a grant level, a grant length, and a start time of a timeslot as a sum of a plurality of grant values of upstream slot bandwidth.

3. (Currently Amended) The bandwidth allocation device as set forth in claim 2, wherein the upstream control message for upstream report includes a queue level, and a queue report as a sum of a plurality of queue state reports.

4. (Original) A dynamic bandwidth allocation method for an Ethernet Passive Optical Network (EPON) including an optical line termination (OLT), an optical distribution network (ODN), and a plurality of optical network units (ONU), the method comprising:

a first step of, upon receipt of a control message for upstream report from the optical network unit, checking which ONU's information is contained in the received control message, and updating a bandwidth;

a second step of, when a sum of bandwidths for HP (High Priority) of all ONUs is more than a link capacity, allocating a bandwidth proportional to the bandwidth for HP of each of the ONUs to each of the ONUs in the same order as a previously allocated order of ONUs, if there is a previously allocated order of ONUs;

a third step of, when the sum of bandwidths for HP (High Priority) of all ONUs is less than the link capacity, allocating a bandwidth equal to the bandwidth for HP to each of the ONUs;

a fourth step of, when a sum of the bandwidths for HP and MP (Medium Priority) of all ONUs is more than the link capacity, using a bandwidth remaining after the allocation for the bandwidths for HP to additionally allocate a bandwidth proportional to the bandwidth for MP of each of the ONUs to each of the ONUs;

a fifth step of, when the sum of the bandwidths for HP and MP of all ONUs is less than the link capacity, using a bandwidth remaining after the allocation for the bandwidths for HP to additionally allocate a bandwidth equal to the bandwidth for MP of each of the ONUs to each of the ONUs;

a sixth step of, when a sum of maximum bandwidths of all ONUs is more than the link capacity, using a bandwidth remaining after the allocation for the bandwidths for HP and MP to additionally allocate a bandwidth proportional to the bandwidth for LP (Low Priority) of each of the ONUs to each of the ONUs; and

a seventh step of, when the sum of the maximum bandwidths is less than the link capacity, allocating an additional bandwidth to each of the ONUs so that a total bandwidth allocated to each of the ONUs is equal to the maximum bandwidth of each of the ONUs, and equally dividing a bandwidth remaining after the bandwidth allocation for the maximum bandwidth to be additionally allocated as a bandwidth for LP to each of the ONUs.

5. (Original) The dynamic bandwidth allocation method as set forth in claim 4, wherein the first step is performed in such a manner that, when the control message for upstream report is received from the optical network unit, it is checked which ONU's information is contained in the received control message, and a request bandwidth for HP, which corresponds to queue length information for HP/update period, is updated, and a request bandwidth for MP, which corresponds to queue length information for MP/update period, is updated, and a request bandwidth for LP, which corresponds to queue length information for LP/update period, is further updated.

6. (Original) The dynamic bandwidth allocation method as set forth in claim 4, wherein

the high priority service is a service having requirements of end-to-end delay and jitter of the services of the ONUs,

the medium priority service is a service which is sensitive to the delay but requires a predetermined bandwidth, and

the low priority service is a BETC (Best Effort Traffic Class) service which has no requirement of end-to-end delay and jitter, and is assigned a marginal bandwidth.

7. (Currently Amended) A computer-readable ~~recording~~ medium for storing instructions, which when executed enables ~~enabling~~ a computer to ~~performs~~perform:

a first step of, upon receipt of a control message for upstream report, checking which of a plurality of ONU's information is contained in the received control message, and updating a bandwidth;

a second step of, when a sum of bandwidths for HP (high priority) of all ONUs is more than a link capacity, allocating a bandwidth proportional to the bandwidth for HP of each of the ONUs to each of the ONUs in the same order as a previously allocated order of ONUs, if there is a previously allocated order of ONUs;

a third step of, when the sum of bandwidths for HP of all ONUs is less than the link capacity, allocating a bandwidth equal to the bandwidth for HP to each of the ONUs;

a fourth step of, when a sum of the bandwidths for HP and MP (medium priority) of all ONUs is more than the link capacity, using a bandwidth remaining after the allocation for the

bandwidths for HP to additionally allocate a bandwidth proportional to the bandwidth for MP of each of the ONUs to each of the ONUs;

a fifth step of, when the sum of the bandwidths for HP and MP of all ONUs is less than the link capacity, using a bandwidth remaining after the allocation for the bandwidths for HP to additionally allocate a bandwidth equal to the bandwidth for MP of each of the ONUs to each of the ONUs;

a sixth step of, when a sum of maximum bandwidths of all ONUs is more than the link capacity, using a bandwidth remaining after the allocation for the bandwidths for HP and MP to additionally allocate a bandwidth proportional to the bandwidth for LP (low priority) of each of the ONUs to each of the ONUs; and

a seventh step of, when the sum of the maximum bandwidths is less than the link capacity, allocating an additional bandwidth to each of the ONUs so that a total bandwidth allocated to each of the ONUs is equal to the maximum bandwidth of each of the ONUs, and equally dividing a bandwidth remaining after the bandwidth allocation for the maximum bandwidth to be additionally allocated as a bandwidth for LP to each of the ONUs.